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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/641,319	08/18/2000	Michael R. Slater	PRMG-04578	7302

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EXAMINER	
HUTSON, RICHARD G	
ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 02/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/641,319	SLATER ET AL.	
	Examiner	Art Unit	
	Richard G Hutson	1652	

-- The MAILING DATE of this communication appears on the cover sh et with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/14/2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-30,40,41 and 44* is/are pending in the application.

4a) Of the above claim(s) *41* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-30,40 and 44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicants amendment of claims 29 and 30 and the cancellation of claims 31-39, 42, 43 and 45-47, in the paper of 11/14/2003, is acknowledged. Claims 22-30, 40, 41, and 44 are at issue and are present for examination.

Applicants' arguments filed on 11/14/2003 have been fully considered and are deemed to be persuasive to overcome some of the rejections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

It is noted that in the previous office action claim 41 was withdrawn from consideration as being drawn to a non-elected invention. While claim 41 was listed on the office action summary sheet as properly being withdrawn, by mistake within the body of the action, in the introductory remarks, claim 40 rather then claim 41 was listed as being withdrawn. Further, claim 41 rather then claim 40 was listed in the 103 rejection. The examiner regrets any confusion this may have caused applicant.

Specification

The disclosure is objected to because of the following informalities:

On page 36, line 21-22 there appear to be amino acid sequences which should also include an associated SEQ ID NO. It is noted that applicants have not responded to this previous objection to the specification

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 22-30, 40 and 44 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

This rejection was stated in the previous office action. In response, applicants have made a minor amendment to the claims and argue the rejection as it applies to the newly amended claims.

Applicants in their traversal initially note that the present claims are copied from U.S. Pat. No. 5,948,614 ("the 614 patent") and that the present specification provides substantially more support for the claims than does the 614 patent, which the office has taken the position was sufficient to support its issued claims. In response to applicants comments, it is noted that the '614 patent is drawn to a *Thermotoga maritima* polymerase and the instant application is drawn to a *Thermotoga neapolitana* polymerase. Further, applicant is reminded that in the previous communication from applicants, applicant stated that applicants copied claims from U.S. Pat. No. 5,939,301 ("the 301 patent"), not U.S. Pat. No. 5,948,614 ("the '614 patent"). As the '301 patent is drawn to a *Thermotoga neapolitana* polymerase, any comments regarding copied claims are assumed to be in reference to the '301 patent, not the '614 patent.

Finally applicants comments regarding claims copied from either the '301 or the '614 patent are not understood as upon inspection it does not appear that applicants have copied claims from either of these patents.

Applicants traverse the rejection on the basis that the specification provides detailed guidance demonstrating that the inventors were in possession of the claimed invention. For example applicants submit that they disclosed numerous illustrative examples of specific non-naturally-occurring *Thermotoga neapolitana* DNA polymerases (i.e. SEQ ID NO:: 8,16, 19, 23, 26, 29, 33 and 35). Applicants submit that a large number of DNA polymerases were known in the field and that the characterization of these polymerase has identified regions in which the various enzymatic activities of the enzymes reside and that mutations within these regions can alter these activities. Applicants further present alignments of the TNE polymerase with other known polymerases and further submit that the specification characterizes certain mutations (i.e. deletions and substitutions) shown to correspond with the corresponding region of enzymatic activity.

Applicants submit that the specification characterizes the TNE sequence and its specific properties to allow a wide variety of non-natural sequences with the desired properties to be selected, such as N-terminal deletions which result in the reduction of the 5' exonuclease activity.

Applicants further argue that the previous rejection has not provided factual support related to the subject matter of the claims in order to assert or maintain the rejection.

Applicants argument is not found persuasive for the following reasons. First applicants are reminded that the currently claimed genus is a large and variable with potentiality of comprising many different DNA polymerase mutants many of which have not yet been identified. This genus encompasses any and all mutants of any DNA polymerase (any pol-I, -II or –III type of polymerase) or fragments thereof capable of DNA synthetic activity which is derived from *Thermotoga neapolitana*.

The specification provides an insufficient number of species encompassed by the claims to be representative of the claimed broad genus. As previously stated, the specification teaches a Tne DNA polymerase, having the amino acid sequence of SEQ ID NO: 2 which is not encompassed by the claimed genus, as well as a number of members of the claimed genus which encompasses those mutations previously known for other highly homologous polymerases, which result in a reduction or elimination of either 3'-5' exonuclease activity and 5'-3' exonuclease activity. These limited number of species are not representative of the claimed genus which includes all isolated mutant Tne DNA polymerases (any pol-I, -II or –III type of polymerase) with any modification, said modifications including those previously identified as well as those yet to be discovered. The claimed genus is infinitesimally large compared to that applicants have shown possession of.

Given this lack of additional representative species as encompassed by the above claims, applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise, and exact terms that a skilled artisan would recognize applicants were in possession of the claimed invention.

Applicant is referred to the revised interim guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 22 and 23 remain rejected under 35 U.S.C. 102(e) as being anticipated by Chatterjee et al. (U.S. Patent No: 5,912,155).

The rejection was stated in the previous office action. And repeated below for applicants convenience.

Chatterjee et al. teach a composition comprising a thermostable Pol-I type DNA polymerase from *Thermotoga neapolitana* (Tne) and they teach that this DNA polymerase is capable of DNA synthetic activity. Chatterjee et al. teach the isolation and cloning of the *T. neapolitana* polymerase gene into the plasmid pSport1. Further more it is believed that the naturally occurring Tne DNA polymerase taught by Chatterjee et al. is capable of both 3'-5' and 5'-3' exonuclease activity and has a specific activity of approximately 100,000 units/mg. It is acknowledged that the DNA polymerase taught by Chatterjee et al. may not be considered "non-naturally-occurring,

however, as Chatterjee et al. also teach fragments of the taught DNA polymerase, these fragments anticipate claims to a fragment of both a naturally-occurring DNA polymerase as well as a noon-naturally-occurring DNA polymerase as many of these fragments are the same molecules.

In response to this rejection applicants have filed a Declaration of inventor James Hartnett under 37 C.F.R. 1.131 to remove the '155 patent as prior art.

The Declaration of inventor James Hartnett under 37 C.F.R. 1.131 filed on 11/14/2003 under 37 CFR 1.131 has been considered but is ineffective to overcome the Chatterjee et al. reference.

The Chatterjee et al. reference is a U.S. patent or U.S. patent application publication of a pending or patented application that claims the rejected invention. An affidavit or declaration is inappropriate under 37 CFR 1.131(a) when the reference is claiming the same patentable invention, see MPEP § 2306. If the reference and this application are not commonly owned, the reference can only be overcome by establishing priority of invention through interference proceedings. See MPEP Chapter 2300 for information on initiating interference proceedings. If the reference and this application are commonly owned, the patent may be disqualified as prior art by an affidavit or declaration under 37 CFR 1.130. See MPEP § 718.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22-30, 40 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chatterjee et al. (U.S. Patent No: 5,912,155) as applied to claims 22, and 23 above, and further in view of Erlich et al.(Science 252:1643-1651, June 1991).

The rejection was stated in the previous office action and repeated below for applicants convenience.

As discussed above, Chatterjee et al. teach a composition comprising a thermostable Pol-I type DNA polymerase from *Thermotoga neapolitana* (Tne) and they teach that this DNA polymerase is capable of DNA synthetic activity. Chatterjee et al. further suggest that the 3'-5' exonuclease activity may be reduced or eliminated by mutating the Tne DNA polymerase such that the region of the gene encoding the 3'-5' domain is deleted.

Erlich et al. review recent advances in the polymerase chain reaction including the modification of the polymerase enzymes used in these methods so as to effect the reactions results. Erlich et al. specifically teach the use thermostable DNA polymerases from a number of thermostable organisms. Erlich et al. further teach removal of the 3' to 5' exonuclease activity is desirable so that the polymerase can be used in sequence-specific priming reactions because this activity removes the mismatched base at the 3-end of the primer. Erlich et al. further teach that a genetically engineered variant of Taq DNA polymerase lacking the 5' to 3' exonuclease permits efficient amplification of long fragments.

One of ordinary skill in the art would have been motivated to mutate the Tne DNA polymerase taught by Chatterjee et al. by deleting the 3'-5' exonuclease domain as suggested by Chatterjee et al. in order to mutate this polymerase so that it can be used in sequence-specific priming reactions as taught by Erlich et al. Further, one of ordinary skill in the art would have been motivated to mutate the Tne DNA polymerase taught by Chatterjee et al. by deleting the 5' to 3' exonuclease domain in order to mutate this polymerase so that it can be used in PCR reactions in which the permits efficient amplification of long fragments is the desired goal, as taught by Erlich et al. The reasonable expectation of success for the removal of either the 3'-5' or 5'-3' exonuclease domains of the Tne DNA polymerase comes from the high degree of knowledge in the art as reviewed by Erlich et al. who describes such mutations of previously isolated DNA polymerases.

As discussed above, in response to this rejection applicants have filed a Declaration of inventor James Hartnett under 37 C.F.R. 1.131 to remove the '155 patent as prior art.

The Declaration of inventor James Hartnett under 37 C.F.R. 1.131 filed on 11/14/2003 under 37 CFR 1.131 has been considered but is ineffective to overcome the Chatterjee et al. reference.

The Chatterjee et al. reference is a U.S. patent or U.S. patent application publication of a pending or patented application that claims the rejected invention. An affidavit or declaration is inappropriate under 37 CFR 1.131(a) when the reference is

claiming the same patentable invention, see MPEP § 2306. If the reference and this application are not commonly owned, the reference can only be overcome by establishing priority of invention through interference proceedings. See MPEP Chapter 2300 for information on initiating interference proceedings. If the reference and this application are commonly owned, the patent may be disqualified as prior art by an affidavit or declaration under 37 CFR 1.130. See MPEP § 718.

Double Patenting

The terminal disclaimer filed on 11/14/2003 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent 6,001,645 has been received and acknowledged. Pending the processing of this disclaimer, it is effective to overcome the previous rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard G Hutson whose telephone number is (703) 308-0066. The examiner can normally be reached on 7:30 am to 4:00 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on (703) 308-3804. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard G Hutson, Ph.D.
Primary Examiner
Art Unit 1652

rgh
2/2/2004